



Attorney Docket No. 0756-7217

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Akira ISHIKAWA et al.

Serial No. 10/697,987

Filed: October 31, 2003

For: SEMICONDUCTOR DEVICE AND
FABRICATING METHOD THEREOF

) Group Art Unit: 2822

) Examiner: K. Picardat

) CERTIFICATE OF MAILING

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) 2005

Adrian M. Stamps

RESPONSE

Honorable Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The Official Action mailed March 24, 2005, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicants respectfully submit that this response is being timely filed.

The Applicants note with appreciation the consideration of the Information Disclosure Statement filed on October 31, 2003. A further Information Disclosure Statement is submitted herewith and consideration of this Information Disclosure Statement is respectfully requested.

Claims 1-41 are pending in the present application, of which claims 1, 6, 11, 16, 21, 26, 28, 30, 32, 34, 36, 38 and 40 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

The Official Action rejects claims 1-41 as obvious based on the combination of U.S. Patent Application Publication No. 2002/0000613 to Ohtani et al. and U.S. Patent

No. 6,057,227 to Harvey. The Applicants respectfully traverse the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Ohtani and Harvey or to combine reference teachings to achieve the claimed invention. MPEP § 2142 states that the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. It is respectfully submitted that the Official Action has failed to carry this burden. While the Official Action relies on various teachings of the cited prior art to disclose aspects of the claimed invention and asserts that these aspects could be used together, it is submitted that the Official Action does not adequately set forth why one of skill in the art would combine the references to achieve the features of the present invention.

The test for obviousness is not whether the references “could have been” combined or modified as asserted in the Official Action, but rather whether the references should have been. As noted in MPEP § 2143.01, “The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (emphasis in original). Thus, it is respectfully submitted that the standard set forth in the Official Action is improper to support a finding of *prima facie* obviousness.

The Official Action concedes that Ohtani does not teach “specific steps of making contact openings for the pixel electrode” (page 2, Paper No. 20050317). The Official Action relies on Harvey to allegedly teach “various methods for making electrodes including having a contact hole and a ‘concave portion’ connected to the contact hole” (*Id.*). Without any citation of support from either Ohtani or Harvey to support the assertion, the Official Action further asserts that “it would have been obvious to one of ordinary skill in the art to use the techniques and structure of Harvey to make the pixel electrodes of Ohtani et al., because it allows for a more accurate and reliable formation of connections of electrodes” (*Id.*). The Applicants respectfully disagree and traverse the above assertions in the Official Action.

There is no showing in Ohtani or Harvey that teaches or suggests that accuracy or reliability are of any concern, or that these concerns could or should be solved by using the techniques and structure of Harvey to make the pixel electrodes of Ohtani. Specifically, it is unclear how or why “a more accurate and reliable formation of connections of electrodes” is relevant to “specific steps of making contact openings for the pixel electrode.” The lack of motivation is all the more pronounced since Harvey is directed to “oxide etch stop techniques for uniform damascene trench depth” and does not appear to be at all concerned with the formation of pixel electrodes.

The object of the present invention is to “level a pixel electrode ... to prevent the occurrence of disclination caused by steps” (page 4, lines 9-12). Ohtani appears to

teach a flat surface after forming embedded conductive layer 341. However, Ohtani does not teach or suggest a flat surface after forming pixel electrode 343 (see Figures 5B and 5C, for example). As noted above, Harvey is not concerned with the formation of a pixel electrode. As such, the Official Action has not provided sufficient motivation to indicate that one of ordinary skill in the art at the time of the present invention would have known to apply the teachings of Harvey to Ohtani, particularly in the formation of a pixel electrode. Also, neither Harvey nor Ohtani appear to be concerned with the prevention of the occurrence of disclination caused by steps.

Also, it is not clear why one of ordinary skill in the art who was concerned with "more accurate and reliable formation of connections of electrodes" would not have simply practiced Harvey alone. It is unclear why it would have been desirable to combine Ohtani and Harvey at the time of the present invention. Therefore, the Official Action has not shown sufficient motivation in Ohtani or Harvey to teach or suggest that the references could or should be combined.

In the present application, it is respectfully submitted that the prior art of record, either alone or in combination, does not expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness.

Furthermore, the prior art, either alone or in combination, does not teach or suggest all the features of the independent claims. Ohtani and Harvey, either alone or in combination, do not teach or suggest a stopper film (claims 6, 28 and 30); that a part of an edge of a contact hole and a part of an edge of a pixel electrode are aligned (claims 11, 21, 36, 38 and 40); or that a part of a conductive film embedded in a contact hole is not covered by a pixel electrode (claim 16). The Official Action appears to be silent as to any of these features of the independent claims.

Regarding claims 1, 26, 28, 30, 32, 34 and 36, Ohtani does not teach or suggest a concave portion and Harvey does not teach or suggest a pixel electrode. Due to the above-referenced lack of motivation to combine Ohtani and Harvey, it is unclear how the prior art anticipates or renders obvious the combination of a concave portion and a pixel electrode as recited in claims 1, 26, 28, 30, 32, 34 and 36.

Since Ohtani and Harvey do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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